

some other rotating member(s) which may or may not, in turn, be connected to one or more flywheels and/or a conventional resistance device.

Left and right foot supporting members 440 have rear ends which are rotatably connected to radially displaced portions of respective cranks 420, thereby defining rotational axes 442. The rotational axes 442 are constrained to rotate about the crank axis 426 and thereby define fixed crank radii.

An intermediate portion of each foot supporting member 440 is sized and configured to support a respective foot of a standing person. A forward end of each foot supporting member 440 is supported by a respective roller 450 which is rotatably mounted on an intermediate portion of a respective handle bar rocker link 470. A lower end of each rocker link 470 is rotatably connected to the forward stanchion 415, and an upper end of each rocker link 470 is sized and configured for grasping. Stops 417 are provided on the forward stanchion 415 to limit pivoting of the rocker links 470 relative thereto. This assembly also facilitates different types of exercises.

A fifth exercise apparatus constructed according to the principles of the present invention is designated as 500 in FIG. 5. The apparatus has a frame 510 which includes an I-shaped base 512; a forward stanchion or upright 515 which extends upward from the base 512 proximate a first end 513 thereof; and a rearward stanchion or upright 516 which extends upward from the base 512 proximate a second, opposite end 514 thereof.

Left and right flywheels 520 are rotatably mounted on opposite sides of the rearward stanchion 516 and rotate together about a common crank axis 526. Those skilled in the art will recognize that the flywheels 520 may be connected to a conventional resistance device or replaced by some other rotating member(s) which may or may not, in turn, be connected to one or more flywheels and/or a conventional resistance device.

Left and right foot supporting members 540 have rear ends which are rotatably connected to radially displaced portions of respective cranks 520, thereby defining rotational axes 542. The rotational axes 542 are constrained to rotate about the crank axis 526 and thereby define fixed crank radii.

Each foot supporting member 540 has an intermediate portion which is sized and configured to support a respective foot of a standing person, and which is supported from beneath by a respective roller 550. Each roller 550 is rotatably mounted on a distal end of a respective beam 554 having an opposite end rotatably connected to the forward stanchion 515. A single actuator 555 is rotatably interconnected between the base 512 and an intermediate portion of the beam 554. The actuator 555 is selectively operable to adjust the elevation of the roller 550 relative to the crank axis 526.

Each foot supporting member 540 has a forward end which is rotatably and slidably connected to a respective handle bar rocker link 570. In particular, on each side of the apparatus 500, a pin 545 extends through a hole in the foot supporting member 540 and a slot 574 in the rocker link 570. An intermediate portion of each rocker link 570 is rotatably connected to the forward stanchion 515, and an upper end of each rocker link 570 is sized and configured for grasping.

Upper body exercise may be provided by other arrangements, as well. For example, handle bars may be pivotally mounted on the frame and movable independent of the foot supporting members and/or any underlying roller; or

handle bars may be rigidly secured to the foot supporting members rather than rotatably mounted on the frame. Also, the orientation of the path traveled by the force receiving members may be adjusted in other ways, as well. For example, an upper stanchion member may move relative to a lower stanchion member and be secured in place by a detent pin arrangement or a lead screw assembly.

In conclusion, the present invention has been described with reference to particular embodiments and applications, but those skilled in the art will recognize additional embodiments, modifications, and/or applications which fall within the scope of the present invention. Also, design considerations may lead to a variety of conventional modifications, such as the addition of inertia altering devices, including, for example, a motor, a "stepped up" flywheel, or an adjustable brake of some sort, and/or the restructuring of parts and/or assemblies, including, for example, rotatably interconnecting components so that an end of a first component is nested between opposing prongs on the end of a second component. Therefore, the scope of the present invention is to be limited only to the extent of the claims which follow.

What is claimed is:

1. An exercise apparatus, comprising:

a frame sized and configured to rest upon a horizontal floor surface;

left and right cranks rotatably mounted on the frame and rotatable about a common crank axis;

left and right rollers rotatable relative to the frame and selectively movable in a plane extending perpendicular to the crank axis; and

left and right foot supports having first portions rotatably connected to respective cranks, and second portions disposed on top of respective rollers, and third portions sized and configured to support respective feet of a person, wherein said foot supports are movable in both rotational and translational fashion relative to said respective rollers.

2. The exercise apparatus of claim 1, wherein the rollers are rotatably mounted on respective rocker links which are pivotally mounted on the frame.

3. The exercise apparatus of claim 2, wherein upper ends of the rocker links are sized and configured for grasping.

4. An exercise apparatus, comprising:

a frame sized and configured to rest upon a horizontal floor surface;

left and right cranks rotatably mounted on the frame and rotatable about a common crank axis;

left and right rollers rotatable relative to the frame and selectively movable in a plane extending perpendicular to the crank axis, wherein the rollers are movable at a user's discretion during rotation of the cranks; and

left and right foot supports having first portions rotatably connected to respective cranks, and second portions supported by respective rollers, and third portions sized and configured to support respective feet of a person.

5. The exercise apparatus of claim 4, wherein the rollers are rotatably mounted on respective rocker links which are pivotally mounted on the frame.

6. The exercise apparatus of claim 5, wherein upper ends of the rocker links are sized and configured for grasping.

7. An exercise apparatus, comprising:

a frame sized and configured to rest upon a horizontal floor surface;

left and right cranks rotatably mounted on the frame and rotatable about a common crank axis;

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left and right rollers rotatable relative to the frame and selectively movable through parallel paths of motion while in axial alignment with one another; and

left and right foot supports having first portions rotatably connected to respective cranks, and second portions supported by respective rollers, and third portions sized and configured to support respective feet of a person.

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8 The exercise apparatus of claim 7, wherein the rollers are rotatably mounted on respective rocker links which are pivotally mounted on the frame.

9. The exercise apparatus of claim 8, wherein upper ends of the rocker links are sized and configured for grasping.

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